

ABSTRACT

A method of using nanostructured chemicals as alloying agents for the reinforcement of fluoropolymer microstructures, including polymer coils, domains, chains, and segments, at the molecular level. Because of their tailorable compatibility with fluorinated polymers, nanostructured chemicals can be readily and selectively incorporated into polymers by direct blending processes. Properties most favorably improved are time dependent mechanical and thermal properties such as heat distortion, creep, compression set, shrinkage, modulus, hardness and abrasion resistance. In addition to mechanical properties, other physical properties are favorably improved, including lower thermal conductivity, fire resistance, and improved oxygen permeability. These improved properties may be useful in a number of applications, including space-survivable materials and creep resistant seals and gaskets. Improved surface properties may be useful for applications such as anti-icing or non-wetting surfaces or as low friction surfaces.